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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/990,704	11/13/2001	Timothy A. Thomas	CR00274M	3897

22917 7590 03/21/2005

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SCHAUMBURG, IL 60196

EXAMINER
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TRAN, KHAI

ART UNIT	PAPER NUMBER
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2637

DATE MAILED: 03/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/990,704

Applicant(s)

THOMAS ET AL.

Examiner

KHAI TRAN

Art Unit

2637

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,8 and 18-23 is/are rejected.
- 7) ☒ Claim(s) 2-7 and 9-17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/13/01</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 11-17 are objected to because of the following informalities: Appropriate correction is required.

Regarding claim 11, lines 13-14, the term "the gradient vector" should be -- the gradient matrix--.

Claims 12-17 are objected by virtue their dependency.

### ***Claim Rejections - 35 USC § 112***

2. Claims 18-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 18-20, the claims are narrative in form, and do not contain positively recited steps of a specific process. Note that method claims should set forth a series of steps in the active tense in an instruction like manner thereby reciting an actual method. Dependent claims should further limit base claims by reciting additional steps in a like-wise fashion. Ex Parte Erlich 3 USPQ 2d 1011 at 1017.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2637

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1, 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yun (U.S. Pat. 6,463,295) in view of Raleigh et al (U.S. Pat. 6,665,545).

Regarding claim 1, Yun disclose a method of operating a communication system comprising: computing at least one receive weight vector as a function of the channel matrix and at least one transmit weight vector; and computing an updated transmit weight vectors as a function of the transmit weight vector, the receive weight vector and the channel matrix (col. 6, lines 1-29). Yun fails to explicitly disclose providing a channel matrix of a gain and phase between each transmit antenna and each antenna of the communication system.

Raleigh et al disclose a channel matrix of a gain and phase between each transmit antenna and each antenna of the communication system (col. 5, line 62 to col.

Art Unit: 2637

6, line 41). It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the channel matrix in the wireless communication system as taught by Releigh et al into the teachings of Yun in order to simultaneously reduce the interference energy radiated to other mobile user.

Claim 8 is similar to claim 1. Therefore, claim 8 is rejected under a similar rationale.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

7. Claim 18 is rejected under 35 U.S.C. 102(e) as being anticipated by Rashid-Farrokhi (U.S. 2002/0027985 A1).

Regarding claim 18, Rashid-Farrokhi discloses a method of operating a communication system comprising: computing a plurality of transmit weight vectors and

a plurality of receive weight vectors that minimizes an expected mean squared error between analytical successive cancellation estimates and transmitted symbols (col. 1, right side {0010}).

***Claim Rejections - 35 USC § 101***

8. Claims 21-23 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claim, where taken as a whole, only performs mathematical algorithm without any limitation to a practical application. For instance, claim 21 recites first step of computing a plurality of transmit weight vectors wherein the transmit weight vectors are computed by a formula as recited in the claim. USPTO on Computer Related invention guidelines that for a claim including such subject matter be statutory, the claimed process must be limited to a practical application of the mathematical algorithm in the technological arts. Since the claim fails to satisfy such a requirement, therefore, it is determined to be non-compliant with 35 USC 101.

***Allowable Subject Matter.***

9. Claims 2-7, 9-10, 11-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter: Yun and Releigh et al fail to disclose computer readable code for computing a gradient matrix as a function of the channel matrix, the receive weight vector and the

transmit weight vector; and computer readable code for computing an updated transmit weight vector as function of the transmit weight vector and the receive gradient matrix.

### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Lozano et al (U.S. Pat. 6,778,612) disclose a space-time processing for wireless system.

Vook et al (U.S. Pat. 6,834,043) disclose a method and device for exploiting transmit diversity in time varying wireless communication systems.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KHAI TRAN whose telephone number is (571) 272-3019. The examiner can normally be reached on 7:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JAY PATEL can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Application/Control Number: 09/990,704  
Art Unit: 2637

Page 7

A handwritten signature in black ink, appearing to read 'Khai Tran', written in a cursive style.

KHAI TRAN  
Primary Examiner  
Art Unit 2637

***March 16, 2005***